# Syndemic Theory and HIV-Related Risk Among Young Transgender Women: The Role of Multiple, Co-Occurring Health Problems and Social Marginalization

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*Objectives.* We assessed whether multiple psychosocial factors are additive in their relationship to sexual risk behavior and self-reported HIV status (i.e., can be characterized as a syndemic) among young transgender women and the relationship of indicators of social marginalization to psychosocial factors.

*Methods.* Participants (n = 151) were aged 15 to 24 years and lived in Chicago or Los Angeles. We collected data on psychosocial factors (low self-esteem, polysubstance use, victimization related to transgender identity, and intimate partner violence) and social marginalization indicators (history of commercial sex work, homelessness, and incarceration) through an interviewer-administered survey.

*Results.* Syndemic factors were positively and additively related to sexual risk behavior and self-reported HIV infection. In addition, our syndemic index was significantly related to 2 indicators of social marginalization: a history of sex work and previous incarceration.

*Conclusions.* These findings provide evidence for a syndemic of co-occurring psychosocial and health problems in young transgender women, taking place in a context of social marginalization. (*Am J Public Health.* 2012;102:1751–1757. doi:10.2105/AJPH.2011.300433)

Transgender women (i.e., male-to-female transgender persons) are individuals whose gender identities are discordant with the male gender they were assigned at birth. During the developmental period from early adolescence through young adulthood, many transgender women struggle to develop a coherent sense of self while addressing feelings of guilt and shame about their identities and pressures to conform to familial, peer, and gender norms. Many feel the need for secrecy, either to pass in their chosen gender or to hide their true feelings to avoid rejection and discrimination.[1] Instead of support and understanding from family, friends, and other adults, these women often experience social rejection and marginalization because of their gender identity and expression, as well as perceived sexual orientation.[2–4] Rejection and marginalization are particularly harmful during this period of developmental vulnerability and often result in severe consequences, as evidenced by high rates of homelessness, trading sexual intercourse for food and other basic needs, and incarceration.[5–9] A growing body of literature suggests that the marginalization experienced by these young women contributes to a wide range of negative health outcomes, such as psychological distress, substance abuse, and victimization (e.g., from verbal, physical, and sexual abuse). All of these outcomes are related to sexual risk behavior and HIV infection.[5–8]

The prevalence of HIV infection among transgender women is equal to or greater than that among other traditionally high-risk groups, such as men who have sex with men (MSM).[10] In a review of 29 studies of HIV incidence, prevalence, and related risk behavior among transgender individuals completed between 1990 and 2003, the average laboratory-confirmed HIV prevalence for transgender women across age groups was 27.7% (4 studies), and the average self-reported HIV prevalence was 11.8% (18 studies that reported prevalence estimates).[10] More recent data from local testing of more than 500 transgender women with no known previous positive HIV test results in Miami Beach, Florida, and San Francisco and Los Angeles, California, found a 12% HIV infection prevalence, which suggests a high percentage of unrecognized HIV infection in this population.[11] In an analysis by age, the most new HIV infections, representing 45% of all cases, were detected among those aged 20 to 29 years.[11]

Estimates of HIV prevalence among young transgender women are scarce and based on very small, nonprobability samples. A community-based study of ethnic minority transgender women (aged 16–24 years; n = 51) found 22% with self-reported HIV-positive status.[6] A previous analysis of study data from young transgender women (aged 15–24 years; n = 151), found a comparable rate of 19% self-reported HIV infection.[7] The higher rate of self-reported HIV infection among young transgender women than among transgender women more generally may result from relatively high rates of HIV testing. A total of 87% of young transgender women in this study had been tested for HIV infection at least once.[7] However, self-reported prevalence of HIV infection among these young women is still likely to be underestimated in light of the evidence of unrecognized infection among those aged 20 to 29 years.[11]

High rates of unprotected receptive anal intercourse among young transgender women[10] place them at risk for both acquiring and transmitting HIV infection. In the review of 29 studies, 31.7% of transgender women reported multiple, primarily male, sexual partners, and 48.3% reported having sexual intercourse with casual partners.[10] The average proportion of any unprotected receptive anal intercourse was 44.1%, and the proportion of unprotected insertive anal intercourse was 27.4% (assessed across various recall periods).[10] In the community-based study of young

transgender women (n = 51), 59% reported having unprotected anal intercourse (receptive or insertive) in the past 12 months.[6]

Multiple psychosocial health problems, including psychological distress, substance use, violence, and victimization are common among transgender women. For example, community surveys suggest rates of depression and suicidality that are up to 3 times as high as in the general population.[3,12–14] Evidence indicates that substance use is common (previous 30-day use of alcohol = 50% and of marijuana = 38%)[15] and that sexual intercourse under the influence of drugs and alcohol is also highly prevalent.[15–17] Studies of violence and victimization among transgender women estimate that 21% to 68% have experienced forced sexual intercourse,[9,18] and between 37% and 65% have experienced physical abuse, as either a child or an adult.[9,15,18]

Similarly, evidence suggests that psychosocial health problems are prevalent among young transgender women. Garofalo et al., in their community-based study of 51 ethnic minority young transgender women, found that although self-esteem and depression were within the normal range on average, both were independently associated with unprotected anal intercourse.[5] In another study, past-year alcohol and marijuana use were reported by 65% and 71% of participants, respectively.[6] Wilson et al. reported that more than 90% of young transgender women in their study sample had used substances in their lifetime (88% had used alcohol; 63%, marijuana; 30%, cocaine; 32%, ecstasy; and 30%, methamphetamine).[7] Sexual intercourse under the influence of alcohol or drugs was reported to be 50% in one study[5] and 53% in another[8] and was significantly associated with unprotected anal intercourse.[5] Garofalo et al. found that more than half of participants reported a history of forced sexual intercourse, which was significantly associated with sexual risk behavior.[5] Reported fear of partner anger and rejection were also given as reasons young transgender women engaged in unsafe sexual intercourse.[6]

Psychological distress and substance abuse, as well as frequent experiences of violence and other forms of victimization, may contribute to HIV risk in this population, potentially fueling heightened rates of HIV infection. In light of the high HIV prevalence rates and the complexity of risk factors associated with risk behaviors and HIV acquisition, a leading group of experts in transgender health has suggested examining HIV risk among young transgender women within the framework of syndemic theory.[19] Singer and Snipes coined the term *syndemic* for the health crisis (co-occurrence of substance use, AIDS, and violence) among poor and underserved inner-city women in the early 1990s.[20] As described by Singer, a syndemic involves

> a set of enmeshed and mutually enhancing health problems that, *working together* in a context of deleterious social and physical conditions that increase vulnerability, significantly affect the overall disease status of a population.[21(p15)]

Thus, a syndemic is more than the interaction of diseases; rather, it is the mutually reinforcing interaction of disease and social conditions.[21–23] Singer and Clair describe syndemics as occurring in "noxious social conditions" and posits that they are often produced by "structural violence of social inequality."[22(p434)]

Stall et al. applied syndemic theory to the study of HIV-related sexual risk among urban MSM. They found that increasing numbers of psychosocial health problems, polysubstance use, depression, partner violence, and childhood sexual abuse were significantly and positively associated with high-risk sexual behavior and HIV infection.[24] Similarly, in an urban sample of ethnically diverse MSM aged 16 to 24 years, Mustanski et al. found that increasing numbers of psychosocial health problems, including binge drinking, street drug use, psychological distress, intimate partner violence, and sexual assault, increased the odds of multiple anal intercourse partners, unprotected anal intercourse, and HIV-positive status.[25]

To our knowledge, syndemic theory has not previously been applied to the study of HIV risk among young transgender women; however, their marked social and economic marginalization and high prevalence of psychosocial health problems and HIV infection suggest that the principles underlying this theory may well apply. The syndemic model, therefore, served as a framework guiding our analysis. We chose specific psychosocial health problems for inclusion in our syndemic model—as the data would allow—that were similar to factors examined among both urban poor and underserved women and urban MSM and that reflected the life circumstances of young transgender women.

We hypothesized that a syndemic of co-occurring health and psychosocial factors such as low self-esteem, polysubstance use, victimization related to transgender identity (e.g., verbal threats and insults, harrassment by chasing or following respondents or damaging their property, and physical assaults), and intimate partner violence (e.g., partner-controlling actions, verbal harassment, threats to physical safety, sexual violence, and pressure or coercion to hide female gender identity) are additive and associated with HIV infection and sexual risk for HIV infection. That is, the more psychosocial health problems reported, the greater the risk for both unsafe sexual behavior and HIV infection. In addition, Singer specified that a syndemic develops in a context of deleterious social conditions that increase vulnerability. Thus, we further tested indicators of social marginalization as correlates of this clustering of psychosocial factors. Our objectives were to (1) assess whether multiple psychosocial factors are additive in their relationship to sexual risk behavior and self-reported HIV status among young transgender women (i.e., could be characterized as a syndemic) and (2) assess the relationship of indicators of social marginalization, such as a history of commercial sex work, homelessness, and incarceration, to these psychosocial factors.

## METHODS

The Transgender Research Youth Project, part of the Adolescent Medicine Trials Network for HIV/AIDS Interventions, funded by the National Institute of Child Health and Human Development, used a community-based participatory research model to conduct a 2-phase cross-sectional study examining HIV-related risk behavior among young transgender women in Chicago and Los Angeles. Both cities have large communities of young ethnically diverse transgender women. In the first phase of the study, we formed a peer and community-based transgender advisory committee at the lead site in Los Angeles (funding did not allow for another advisory group in Chicago) to guide questionnaire and study protocol development, refine recruitment strategies, and complete a pilot test of all study procedures.

The second phase of the study collected cross-sectional data through an interviewer-administered survey. A subsample of participants also completed in-depth qualitative interviews.

In 2005 to 2006, we recruited young transgender women from medical clinic settings; in social venues, such as bars and clubs; and through street outreach and referrals from study participants. Eligibility criteria were (1) self-identifying as a transgender woman or not identifying with assigned male birth gender, (2) residing in the Chicago or Los Angeles metropolitan area, (3) being able to speak and understand either English or Spanish, and (4) being aged 15 to 24 years. We obtained a waiver of parental consent for participants aged 15 to 17 years and written consent (or assent from minors) prior to study participation. Participants received a $25 incentive for completion of the study.

## Measures

Data were collected through an interviewer-administered survey, with questions regarding general demographic characteristics, HIV risk behaviors, indicators of social marginalization, as well as psychosocial health status. When possible, we used items from existing questionnaires or modified them to be sensitive and appropriate for young transgender women. The transgender advisory committee reviewed and approved the entire survey instrument.

*Demographics.* Participants reported their age, race, ethnicity, and HIV status. Because of the small sample size and to contrast the 2 predominant racial and ethnic groups in the sample (African American and Latina) with all others, we created 2 dummy variables to reflect African American (1 = African American, 0 = non–African American) and Latina (1 = Latina, 0 = non-Latina) race/ethnicity.

*Syndemic index.* We created a composite syndemic index of 4 health and psychosocial factors: low self-esteem, polysubstance use, victimization, and intimate partner violence. For self-esteem, we used the total score of a modified version of the Rosenberg Self-Esteem Scale[26] (i.e., modified by the transgender advisory committee to refer specifically to transgender status). Cronbach's $\alpha$ for the modified self-esteem scale was 0.72. For inclusion in the syndemic index, we dichotomized this variable at the mean (mean = 24; SD = 4.5) to reflect low self-esteem (1) versus high self-esteem (0). In addition to providing an advantageous distribution for the purposes of analysis, scores on this variable of 24 or higher corresponded to agreement–strong agreement with indicators of a positive orientation toward the self.

Participants reported any lifetime use of alcohol or other substances: marijuana, hallucinogens (LSD, mushrooms), PCP, ecstasy, ketamine, GHB, crack, cocaine, heroin, and methamphetamines (1 = yes, 0 = no). We summed these items and created a variable reflecting polysubstance use to reflect any lifetime self-reported use of 3 or more substances (1 = yes, 0 = no). Although we used both lifetime and 30-day recall periods to collect substance use information, we chose lifetime indicators for the polysubstance use indicator in this analysis because of the youth of the participants and the potential negative impact of even 1-time use of substances.

We assessed victimization with a 10-item measure of victimization developed by D'Augelli et al. for lesbian, gay, and bisexual youth[27]; the transgender advisory committee adapted it to reflect the language and experiences of young transgender women. The measure comprised 3 dimensions of victimization tied to gender identity: being verbally threatened or insulted, being chased or followed or suffering property damage, and being physically assaulted. For example, an item asked, "How many times have you been punched, kicked, or beaten because you are, or were thought to be transgender?" Responses were coded on a frequency scale (0 = never, 1 = once, 2 = twice). Average scale scores were dichotomized to reflect endorsement of victimization tied to gender identity (0 = 0–< 1, 1 = ≥ 1–3).

We assessed intimate partner violence with 5 items developed specifically for young transgender women by the transgender advisory committee. The 5 items assessed experiences in 5 different domains:

1. partner-controlling activities,
2. verbal harassment,
3. threats to physical safety,
4. sexual violence, and
5. pressure or coercion to hide female gender identity.

For example, an item asked, "Has a partner made you do something that did not agree with your gender identification (e.g. make you hide your make-up)?" Responses were rated as 1 (yes) or 0 (no). We then recoded summed responses to reflect any experience of any intimate partner violence (1) versus no such experience (0). We created the syndemic index by summing these 4 dichotomous variables, as has been done in previous studies that employed a syndemic perspective.[24,25] We censored the index at 3 to correct for nonnormal distribution (only 4.6% of the sample scored 4; final range = 0–3).

*Social marginalization.* We created 4 dichotomous indicators of social marginalization from self-reports of ever having been homeless, incarcerated, or a participant in commercial sex work or survival sex (1 = ever, 0 = never). Ever homeless was indicated by a yes response to the question, "Have you ever spent one night or more in an emergency shelter, transitional housing facility, welfare hotel or a public or private place not designed for sleeping (e.g. car, park, etc.)?" A history of incarceration was indicated by a yes response to the question, "Have you ever been in the correctional system? (For example, convicted of a crime and sent to juvenile corrections, jail, prison, probation, parole)?" Participation in commercial sex work or survival sex was indicated by a yes response to the question, "Have you ever traded sexual activity or favors for food, money, a place to sleep, drugs or other material goods?"

*Sexual risk behavior.* Sexual risk behavior was a primary outcome variable and was defined as having any unprotected anal intercourse (insertive or receptive) with any type of sexual partner within the past 3 months (1 = yes, 0 = no; responses indicating no previous anal intercourse or always having protected anal intercourse in the past 3 months were coded as 0).

*HIV status.* We created a dummy variable for self-reported HIV-positive status (1 = HIV positive, 0 = HIV negative, untested, or unknown).

## Analysis

We conducted correlational analyses to measure the size and significance of relationships between components of the syndemic index (in their original undichotomized format), self-reported HIV status, and unprotected anal

intercourse (i.e., point–biserial correlations). We used multiple logistic regression models to assess the relationship between the syndemic index and primary outcomes (unprotected anal intercourse, self-reported HIV serostatus). We calculated odds ratios for sexual risk behavior and self-reported HIV status for an increasing number of syndemic factors, with the syndemic index specified as a categorical variable (with 0 as the reference group).

We then assessed the relationship of the syndemic index to social indicators of marginalization (ever homeless, ever incarcerated, and ever participating in sex work) with a multiple linear regression model. We used age as a continuous variable and controlled for it in all multiple regression analyses, in light of the well-established relationship between age, sexual risk behavior, and HIV infection. In the model that regressed the syndemic index on indicators of social marginalization, we also controlled for African American race in the analysis (in addition to age), because of significant correlations with indicators of social marginalization.

## RESULTS

A total of 151 young transgender women participated in the study (mean age = 21 years; SD = 2.5 years; Chicago, n = 75; Los Angeles, n = 76). Thirty-nine percent of participants described their race/ethnicity as Black or African American, 38% as Latina, 13% as other (multiple races or ethnicities, Native American, or other race or ethnicity), 5% as White, and 5% as Asian/Pacific Islander (Table 1). More than half (61%) of the participants had at least a high school diploma or equivalent, and a third (34%) were currently employed. Self-reported HIV-positive status was 16% for the overall sample and 19% among participants who reported being tested for HIV. Approximately a third (32%) of participants reported unprotected anal intercourse in the past 3 months. In addition, almost half (43%) of participants had a history of homelessness, more than half (52%) had a history of incarceration, and a majority (67%) had engaged in sex work.

Our analysis of correlations between syndemic factors, sexual risk behavior, and self-reported HIV status (Table 2) found that both polysubstance use and intimate partner violence were significantly and positively related to both self-reported HIV infection and sexual risk behavior, as well as to each other, and that victimization and intimate partner violence were significantly and positively related to each other. All other correlations (except for self-esteem with self-reported HIV infection and polysubstance use) were in the expected direction but not significant.

In multiple logistic regression analysis (Table 3), the effect of increasing numbers of syndemic factors was additive for self-reported HIV status for 1 to 2 and for 2 to 3 or 4 factors (odds ratio [OR] = 1.65 for 1 factor, 3.13 for 2 factors, and 6.61 for 3 or 4 factors). For sexual risk behavior, the effect was additive only for 1 to 2 factors (OR = 2.87 for 1 factor, 5.46 for 2 factors, and 4.53 for 3 or 4 factors).

In analysis of the relationship between indicators of social marginalization and the syndemic index, we found that a history of ever engaging in sex work was significantly associated with the syndemic index (B = 0.70;

**TABLE 1—Demographic, Health, and Social Characteristics of Young Transgender Women: Chicago and Los Angeles, 2005–2006**

| Variable | No. (%) or Mean (SD) |
|---|---|
| Mean age, y | 21 (2.5) |
| Race/ethnicity | |
| African American | 59 (39) |
| Latina | 58 (38) |
| Other | 20 (13) |
| White | 7 (5) |
| Asian/Pacific Islander | 7 (5) |
| Completed high school | 92 (61) |
| Currently employed | 51 (34) |
| HIV positive (self-reported) | 24 (16) |
| Unprotected anal intercourse in past 3 mo | 48 (32) |
| History of homelessness | 65 (43) |
| History of incarceration | 78 (52) |
| History of sex work | 101 (67) |

*Note*. The sample size was n = 151.

**TABLE 2—Bivariate Correlations Between Components of the Syndemic Index, Unprotected Anal Incourse, and HIV Infection Among Young Transgender Women: Chicago and Los Angeles, 2005–2006**

| Syndemic Index Items | Unprotected Anal Intercourse | HIV Positive (Self-Reported) | Self-Esteem | Polysubstance Abuse | Victimization | Intimate Partner Violence |
|---|---|---|---|---|---|---|
| Unprotected anal intercourse | . . . | | | | | |
| HIV positive (self-reported) | 0.16 | . . . | | | | |
| Self-esteem | –0.02 | 0.08 | . . . | | | |
| Polysubstance use | 0.31** | 0.25** | 0.05 | . . . | | |
| Victimization | 0.15 | 0.17 | –0.13 | 0.15 | . . . | |
| Intimate partner violence | 0.24** | 0.26** | –0.03 | 0.30** | 0.38** | . . . |

*Note*. The total sample size was n = 151, but for this analysis, n = 131 because of missing data on outcomes of interest. Participants could decline to answer these items.
**$P \leq .01$.

**TABLE 3—Logistic Regression of HIV Infection and Unprotected Anal Intercourse on Syndemic Factors Among Young Transgender Women: Chicago and Los Angeles, 2005–2006**

| Syndemic Index Factor, No. | HIV Positive, AOR (95% CI) | Unprotected Anal Intercourse, AOR (95% CI) |
|---|---|---|
| 1 | 1.65 (0.30, 9.15) | 2.87 (0.83, 9.96) |
| 2 | 3.13 (0.59, 16.46) | 5.46** (1.55, 19.12) |
| 3 or 4 | 6.61* (1.25, 34.85) | 4.53* (1.21, 16.98) |

*Note*. AOR = adjusted odds ratio; CI = confidence interval. Total sample size = 151, but for this analysis, n = 131 because of missing data on outcomes of interest. Participants could decline to answer these items. Models controlled for age.
*$P \leq .05$; **$P \leq .01$.

SE = 0.20; $P < .01$), as was a history of incarceration (B = 0.49; SE = 0.18; $P < .01$); we found no correlation for a history of homelessness (Table 4).

## DISCUSSION

Our findings provide preliminary evidence suggesting that multiple health-related psychosocial factors—low self-esteem, lifetime polysubstance use, intimate partner violence, and victimization—may be additive in their association with sexual risk behavior and self-reported HIV infection among young transgender women. Although we found no significant association between 1 syndemic factor and sexual risk and 1 to 2 syndemic factors and seropositivity, this may be a function of small sample size. The additive trend in these factors in their relationship to sexual risk behavior and HIV status among young transgender women are similar to previous findings among urban MSM and ethnically diverse young MSM.[24,25] In addition, our findings highlight the social situations or life experiences that are associated with these conditions—a history of sex work and incarceration, which contribute to these co-occurring conditions and their resulting heightened HIV risk. Evidence of disproportionately high prevalence of psychosocial health conditions in young transgender women has been documented; our study provides evidence of a potential additive effect on sexual risk for HIV and self-reported HIV-positive status and the interrelationship of these conditions with key indicators of social marginalization.

**TABLE 4—Multiple Linear Regression of the Syndemic Index on Indicators of Social Marginalization Among Young Transgender Women: Chicago and Los Angeles, 2005–2006**

| Indicators of social marginalization | B (SE) |
|---|---|
| History of homelessness | 0.76 (0.18) |
| History of incarceration | 0.49** (0.18) |
| History of sex work | 0.70** (0.20) |

*Note*. The total sample size was n = 151, but for this analysis, n = 131 because of missing data on outcomes of interest. Participants could decline to answer these items. Models controlled for age and race/ethnicity.
**$P \leq .01$.

Our findings regarding the relationship of sex work and incarceration with psychosocial health problems and the interrelationship of these problems with sexual risk and HIV infection are also important. In a previous analysis of these data, Wilson et al. found a direct relationship between sex work and HIV status; 26% of respondents who had engaged in sex work were HIV-positive compared to 6% seropositivity among those who had never engaged in sex work.[7] This finding is consistent with previous studies suggesting disproportionate prevalence of HIV infection among transgender sex workers, particularly in comparison with other sex workers.[28] It is important to note that not all sex work presents equal risk. New evidence is emerging that risk may differ by type of sex work (e.g., street work versus Internet-based work).[29] Future studies should determine the varying risks by sex work type to more effectively target prevention interventions. Our findings suggest that in addition to the direct impact on self-reported HIV status, sex work may also have an indirect relationship on this status through psychosocial health problems. Thus, an exploration of the potential mediation of the effect of sex work on HIV status by psychosocial factors should be the subject of future study.

### Limitations

We conducted a secondary analysis of data collected for a general study of young transgender women. Therefore, syndemic theory did not directly influence the research design, identification of constructs, or data collection instrument. Consequently, measurement was a particular limitation in our study. In the absence of a measure of psychiatric distress, we used low self-esteem as a mental health indicator in our syndemic index. In our correlational analysis, although we found self-esteem to be related to the other components of the syndemic index and outcomes of interest in the expected direction (in most cases), correlations were weak and not statistically significant. Similarly, our measure of victimization (with a limited-frequency response scale: never, once, twice, > twice) was weakly related to other syndemic components and outcomes of interest. Thus, more sensitive measures of psychological outcomes and victimization should be included in future studies of this population, particularly in light of recent evidence suggesting that early gender-related victimization is a key factor in psychiatric distress among young transgender women.[13] A recent study of 571 transgender women (aged 19–59 years) in the New York City metropolitan area suggests a dose–response relationship between abuse and depression in adolescence.[30] Prevalence of depression and suicidality during early adolescence (10–14 years of age, derived from retrospective recall) in their young cohort (ranging in age at time of the study from 19 to 39 years), was nearly 2 to 3 times as high as among adolescents in general (which declined as they entered young adulthood). In addition, gender-related abuse, both psychological and physical, was extremely high during early and late adolescence. Abuse and psychiatric distress had a dose–response relationship in both early and late adolescence. Although the impact of psychiatric distress and abuse on HIV risk and HIV status were not assessed, these findings are important within the context of the early development of young transgender women and may have implications for other health conditions. Thus, research from a syndemic perspective with more sensitive measures is warranted.

Our data came from a small convenience sample of young transgender women from 2

large cities; therefore, our results may not generalize to other populations of young transgender women. In particular, this sample was characterized by a high prevalence of previous homelessness (43%), incarceration (52%), and sex work (67%), which may not characterize other populations of transgender youths. This was a particularly high-risk urban sample. In addition, the small sample size did not permit breaking down sexual risk by partner type or concordant–discordant HIV status. Furthermore, the study protocol did not include HIV testing; therefore, HIV status was self-reported and thus likely underreported. Larger samples with collection of biomarkers would allow for more rigorous analysis of risk.

This was a cross-sectional study, which prevented an assessment of causal ordering. Future studies are needed to describe the onset and trajectory of psychosocial health problems and their impact on HIV-related risk. This requires longitudinal research focused specifically on syndemic components measured over time. As recently recommended by the Institute of Medicine in a groundbreaking report on the health of lesbian, gay, bisexual, and transgender people, a more rigorous program of research, including longitudinal research on transgender health, is needed, because most studies of transgender individuals are cross-sectional, with small, nonprobability samples.[31] Our data were collected through interviewer-administered surveys; although underreporting of sensitive behavior might be expected, respondents in this sample reported high levels of both substance use and sexual risk behavior.[7,8]

## Conclusions

Our findings provide preliminary evidence of the additive relationship of multiple psychosocial health factors to HIV sexual risk behavior and HIV serostatus among young transgender women. Further validation studies are warranted with larger sample sizes.

In light of the young age of these transgender women, developmental considerations are of particular importance in planning interventions. The coalescence of low self-esteem, polysubstance use, victimization, and intimate partner violence at such a young age may present a psychosocial health burden that is difficult to overcome. Future studies are needed to explore whether intervening on multiple health issues together or in sequence is effective in preventing sexual risk behavior. In addition, prevention efforts among this population of young people may require a multisystems approach targeting both social and health-related factors. ■

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## Contributors

J. Brennan originated the study, managed its implementation, and was the primary author of the article. L. M. Kuhns developed and ran the analysis for the study. A. K. Johnson assisted in the data analysis. M. Belzer was the site principal investigator in Los Angeles and assisted with the study development and implementation. E. C. Wilson assisted in study development. R. Garofalo was the site principal investigator in Chicago and assisted with study development and implementation. The Adolescent Medicine Trials Network for HIV/AIDS Interventions facilitated funding and coordination for the entire study. All authors helped to conceptualize ideas, interpret findings, and write and review drafts of the article.

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## Human Participant Protection

Each site obtained institutional review board approval for the study protocol prior to implementation.

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